32.6 Ac
635 Ac

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

Project h-1-22 Date Author

SUBJECT—

TITLE

FOREST INSECT SURVEY - SEASON OF 1943

SEQUOIA NATIONAL FOREST, CALIFORNIA

by

John E. Patterson

Forest Insect Laboratory
341 Giannini Hall, U. C.
Berkeley 4, California
March 14, 1944

INDEX NO.—

U. S. GOVERNMENT PRINTING OFFICE 8—9742

6 copies typed; distribution as follows:

1 - FCC
1 - Berkely file
1 - R.O.C (Timber Management)
1 - Sequoia N.F., Supervisor Moore
1 - F.S., Washington
1 - P. E. Patterson

U. S. Department of Agriculture
Bureau of Entomology and Plant Quarnatine
Forest Insect Investigations

FOREST INSECT SURVEY - SEASON OF 1943

SEQUOIA NATIONAL FOREST, CALIFORNIA

Approved by:

F. P. Keen

Senior Entomologist, in Charge

Submitted by:

John E. Patterson

Entomologist

Forest Insect Laboratory
341 Giannini Hall, U. C.
Berkeley 4, California
March 14, 1944

ABSTRACT OF RESULTS

A. The Reporting Area

1. Total acreage — 248,000 acres
2. Volume of pine timber — unknown

B. The 1942 Infestation (complete record)

1. Total pine timber killed on reporting area (Table 2)
   a. Number of trees — 1,760
   b. Volume — 1,885,000 b.ft.

2. Classification of infestation - normal endemic

3. Primary insects: Western pine beetle in ponderosa pine
   Mountain pine beetle in sugar pine
   Jeffrey pine beetle in Jeffrey pine
   Fir engraver beetle in white fir and red fir

4. Trend of infestation: Static, slight increase over 1941

C. The 1943 Infestation (partial record)

1. Primary insects: Same as in the 1942 infestation

2. Probable trend: Slight increase over 1942. Potential epidemic conditions present in ponderosa-sugar pine stands.

3. Control recommended: None

INTRODUCTION

The 1943 forest insect survey of Sequoia National Forest, California, was made during the period September 14-17, 1943, by John M. Miller and John E. Patterson of the Berkeley forest insect laboratory, Bureau of Entomology and Plant Quarantine. The purpose of this survey was to locate any damaging forest insect infestations, to obtain information on resultant losses in commercial timber stands and to recommend control work where and when necessary. This is a service of mutual benefit to the Forest Service in its management plans and to the forest insect laboratory in its long-time research studies of bark beetle infestations.

Methods of survey used in 1943

In the 1942 survey report it was pointed out that, because of the extremely rough topography and interrupted continuity of timber stands, the conventional type of insect survey based primarily on measured check plots was unsuitable and inadequate for these stands. At that time it was recommended that some other method of wider scope be adopted. Hence, in 1943 a different type of survey was employed which is believed to be better adapted to conditions found on this forest. In the main, it consisted of using established roads to traverse the forests and viewing the principal infestation areas from vantage points. In addition, measured samples were obtained by surveying roadside strips wherever these could be located on representative sites. It was possible to set up at least one or more such strips in each infestation area. Since several of the strips were set up prior to 1943, the loss record is now continuous for a period of over three years. In addition to portraying annual infestation conditions, the oldest established records indicate infestation trends.

The measured plot data were further supplemented by reconnaissance observations and extensive counts of faded trees. A combination of these primary data formed the basis for the loss estimates given later in this report.

Character of the infestation

Activity of bark beetles over the entire forest was generally endemic, resulting in losses somewhat lower than in recent years. No aggressive attacks were found except in certain local areas situated in the Deer Creek district. Here, several small groups of ponderosa pine, with an occasional sugar pine, were attacked during the year. These persistent infestations appear to have resulted from bark beetles breeding in windthrown timber. During the past five years, winter windstorms have annually produced an abundance of slash in the pine stands which has been a prime factor in maintaining these infestations at about the same level. Elsewhere infestations in ponderosa-sugar pine stands have been sustained at low endemic status.

Losses during the year in the extensive Jeffrey pine stands were remarkably low, with no aggressive attacks found anywhere.

The spectacular top-killing by Ips reported last year on certain areas in Kings River district has completely disappeared without further mortality in affected stands.

Infestations in fir were definitely lower throughout these stands. The few attacks observed were confined to the extreme tips of trees and were widely scattered.

Infestations as a whole in 1943 were somewhat less than in 1942. This status was more pronounced in Jeffrey pine and fir than in ponderosa-sugar pine stands. Generally, trees selected for attack were mature or overmature and for the most part were widely separated.

Insects responsible for losses

Losses in ponderosa pine were mainly due to the western pine beetle, Dendroctonus brevicomis Lec. Small group attacks occurred locally on a few areas in the southern part of the forest, but generally attacks were scattered and confined to individual trees. Losses in sugar pine resulted from attacks by the mountain pine beetle, Dendroctonus monticolae Hopk., and were widely scattered. The Jeffrey pine beetle, Dendroctonus jeffreyi Hopk., was mainly responsible for losses in Jeffrey pine. The fir engraver beetle, Scolytus ventralis Lec., was responsible for top-killing of fir. This type of damage was not intense or extensive, but was highly conspicuous due to the high visibility of the fades contrasting with the green forest canopy.

Conditions on entomological units

Due to the interrupted character of timber stands, the survey resolved itself into a series of examinations of separate timbered basins which were largely independent of each other. Wherever conditions were favorable, ground samples of the infestation were obtained by surveying roadside strips. The resultant data are shown in Table 1.

Table 1. Measured pine losses sustained in 1943 on roadside strips.

Reporting Area	Entomological Unit	Sample Strip	Acreage	Tree Spp.	No. of trees	Volume bd.ft.	Volume per acre
Kings Rv.	1 Millwood	RD-1	108	SP	1	4,350	40 b.f.
	2 Beartrap	RD-2	68	JP	1	3,950	60 b.f.
			176	SP-JP	2	8,300	47 b.f.
Tule Rv.	4 Nelson	RD-3	68	SP	1	810	12 b.f.
				PP	1	130	2 b.f.
				JP	1	550	8 b.f.
			68	SP-PP-JP	3	1,490	22 b.f.
Deer Cr.	6 Starvation	RD-4	88	SP	1	1,310	15 b.f.
				PP	1	810	9 b.f.
			88	SP-PP	2	2,120	24 b.f.
Kern Rv.	7 Peppermint	RD-5	120	JP	2	2,600	22 b.f.
	8 Johnsondale	RD-6	80	SP	1	1,210	15 b.f.
				JP	1	840	10 b.f.
			200	SP-JP	4	4,650	23 b.f.

Millwood-Beartrap. The remaining virgin pine forests on these units are composed largely of mature and overmature trees highly susceptible to insect attack. However, site conditions are generally favorable except along the lower fringe of the pine belt where severe losses have been sustained in past beetle epidemics. During the current cycle losses have remained at a low level. The most recent loss for which the complete record is available, that for 1942, amounted to an average of 10 board feet per acre in all pine species. The estimated loss for 1943 is somewhat greater, but is still below normal level for these stands.

Wishon-Nelson. These are primarily recreational areas and are subjected to the usual hazards created by visitors and campers. Site conditions are poor with corresponding high insect hazard. Severe insect-caused losses have occurred at frequent intervals during the past decade resulting in an accumulation of snags and openings in the forests. Although recent infestations have been moderately low, the conditions found in 1943 indicate an early change toward increased losses. Management plans should provide for frequent inspections to detect any upswing of infestations.

Parker-Starvation. The pine stands on these units are rather fragmentary with a large amount of fringe-type forests. All are highly susceptible to beetle attack. Past infestations have resulted in a great thinning of the stands through the loss of mature trees. Due to the many exposed sites, windstorms have periodically resulted in amassing slash which has been a prime factor in maintaining infestations at a high level. Because of the adverse conditions, recurrent high losses may be expected in mature trees.

Kern River units. The major pine species on these units is Jeffrey pine and the stands are mainly located at high elevations. While there is a great preponderance of mature trees, the insect hazard is relatively low except on the exposed sites. Past losses have been sustained at low level. No early change in this status is indicated by current infestation conditions.

Amount and Trend of Infestation

A summary of insect-caused losses sustained during the last two years on the several entomological units is shown in Table 2. Primary data resulting from roadstrip sampling, supplemented by extensive counts of faded trees, formed the basis for the general estimates shown in this table.

The data for 1942 are complete; those for 1943 are approximately 75 percent complete because late seasonal attacks had not become evident at the time the survey was made.

A comparison of annual losses for the biennium shows the most recent trend in these infestations. Generally low endemic conditions have prevailed throughout the forest for the past three years. This condition was not greatly changed during 1943. Slightly increased losses

in ponderosa-sugar pine occurred in Kings River area and in the Tule River areas. However, the increase was not sufficient to indicate impending epidemic conditions. Conversely, slightly reduced losses resulted from the year's infestation in these species in Deer Creek and Kern River areas. Infestations in Jeffrey pine remained static during the same period. On none of the reporting areas has the change in status been sufficient to be significant.

Table 2. Estimated insect-caused losses in pine on entomological units for the years 1942 and 1943.

Entomological Unit	Timbered Acreage	Tree Spp.	Trees killed in 1942		Trees killed in 1943	
			Trees	MBM	Trees	MBM
1 Millwood	25,000	PP-SP-JP	160	350	230	460
2 Beartrap	20,000	PP-SP-JP	130	140	180	215
3 Wishon	12,000	PP-SP-JP	110	100	90	120
4 Nelson	16,000	PP-SP-JP	250	200	200	160
5 Parker	12,000	PP-SP-JP	300	360	160	180
6. Starvation	15,000	PP-SP	360	390	200	225
7 Peppermint	30,000	JP-SP	300	240	280	210
8 Johnsondale	20,000	SP-JP	90	75	110	90
9 Bull Run	15,000	JP	60	30	70	35
	165,000		1,760	1,885	1,520	1,695

RECOMMENDATIONS

Bark beetle infestations have persisted in all pine species on the Sequoia Forest during the past two years. While losses have been maintained at a high endemic level, none are sufficiently serious to warrant any special control action.

Potential epidemic conditions are discernable on Tule River and Deer Creek areas and in the fringe forests of Kings River area. Developments on these areas should be closely watched during 1944.